National Institute of Environmental Health Sciences

Identification of heat risk patterns in the U.S. National Capital Region by integrating heat stress and related vulnerability

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Abstract:

The increase in the number and severity of weather extremes (including excessive heat) potentially associated with climate change has highlighted the needs for research into risk assessment and risk reduction measures. Extreme heat events, the focus of this paper, have been consistently reported as the leading cause of weather-related mortality in the United States in recent years. In order to fully understand impact potentials and analyze risk in its individual components both the spatially and temporally varying patterns of heat and the multidimensional characteristics of vulnerability have to be considered. In this paper we present a composite index aggregating these factors to assess heat related risk for the U.S. National Capital Region in 2010. The study reveals how risk patterns are in part driven by the geographic variations of vulnerability, generally showing a clear difference between high-risk urban areas and wide areas of low risk in the suburban and rural environments. This pattern is particularly evident for the core center of the study area around the District of Columbia, which is largely characterized by high index values despite not having experienced the peak of the heat stress as compared to other regions in the metropolitan area. The article aims to set a framework for local-level heat stress risk assessment that can provide valuable input and decision support for climate adaptation planning as well as emergency managers aiming at risk reduction and optimization of resource distribution.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Geographic Feature:

resource focuses on specific type of geography

Rural, Urban, Other Geographical Feature

Other Geographical Feature : suburban

Geographic Location:

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly

Other Vulnerable Population: low education; impoverished; non-English speaking;social isolation

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content